

## **REMARKS**

Applicant has carefully reviewed the Office Action mailed June 9, 2008. At the time of the Office Action, Claims 25-45 were pending. Applicant has amended Claims 25-26 and has added Claim 46. Applicant submits the following remarks for consideration.

Applicant has previously submitted a Change of Correspondence Address form. Please forward all future correspondence to:

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On a telephone interview with the Examiner the Applicant received an advice from the Examiner on how to advance prosecution of the Patent Application and on how to file Request for Continuation (MPEP 706.07(h) while filing disclosure, arguments, and/or an amendment to the last office action.

The Examiner has rejected Claim 26 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The Examiner states "With respect to Claim 26, a "sharp" tip is not disclosed in the Specification of the instant application, nor was it disclosed in provisional application 60/102,159. Arguments traversing the "new matter" rejections should be accompanied by pinpoint citations to the specification or provisional application, indicating where support can be found." The Applicant has used the word "sharp" as a synonym of the word "pointy" as described in the Application, "A pointy substrate (such as the AFM tip) the apex will etch a NCRS first, prior to any etching around it. In addition, if the AFM tip apex is sufficiently small only small number of holes will be etched. In extreme cases only one hole will be formed." (Specification 9:10-11) In order to make the claim acceptable the Applicant has amended Claim 26 to replace "sharp" with "pointy."

The Examiner has rejected Claims 25-29, 32-40 and 42-45 under 35 U.S.C. 102(b) as being anticipated by WO 96/38705 to Baldeschwieler, et al. (California Institute of Technology) in view of Iijima, et al., *Single-shell carbon nanotubes of 1-nm diameter*, Nature 1993: 363: 603-605 (hereinafter "Iijima at \_").

The Examiner states "With respect to Claims 25-29, Baldeschwieler discloses a device comprising a substrate, a protrusion, pore and carbon nanotube. *See generally* (Baldeschwieler "Figs 1-6"). Note also the passages at (Baldeschwieler 6: 1-18) (tip and substrate/"cantilever" of the same material, silicon), (Baldeschwieler 14:23 - 15:6), and (Baldeschwieler 30: 1-11) (discussing nanotubes). Figures 5-6 teach the "pore on the protrusion" limitation."

The following clarifications and arguments are submitted in response to this rejection. Baldeschwieler et al. does not disclose a pore and they do not disclose a carbon nanotube coupled to the pore. Instead, Baldeschwieler et al. disclose coating "passivation" of the probe tip and forming an uncoated area to which molecules are attached, "For sensing and manipulation techniques which require attachment of a single macromolecule, the method of preparing the probe comprises the step of protecting an area at the tip of a probe from a passivating agent, where the area is suitable for covalent linkage thereto of a single macromolecule. Preferably, this area is in the range of about 10,000 Å<sup>2</sup> to 3 Å<sup>2</sup>. The tip is then contacted with a passivating agent so that its unprotected portion is passivated. The unpassivated area is then deprotected and one end (the proximal end) of a single macromolecule is covalently attached to the unpassivated area." (Baldeschwieler 4:15-22) and "Passivation, as used herein, means the protection by way of a layer on or by chemical, optical, or electric treatment of a substrate surface to isolate the substrate from electrical and chemical conditions in the environment." (Baldeschwieler 12:15-17) Furthermore Baldeschwieler et al. fails to describe or disclose the depth or the aspect ratio of the "small area 40 at the apex of the scanning probe tip 42."

The Applicant believes that the uncoated area disclosed by Baldeschwieler et al. is physically different than a volumetric pore as disclosed in this Application. The Application discloses "Next, in step 12, an NCRS with controlled shape, diameter and length is made in a layer at a specific desired location on the MEMS substrate. If the

NCRS has high aspect ratio, the NCRS may be used to control the shape, length, and diameter of the carbon nanotube. This method of control is referred to as a template method. If the NCRS has small aspect ratio, the NCRS may control the diameter of the carbon nanotube. This method of control is referred to as a pore method.” (Specification 5:10-15) Furthermore, Iijima et al. do not disclose a protrusion, a pore, and they do not disclose a carbon nanotube grown from the pore. Therefore, the Applicant respectfully requests that Claims 25-29 be allowed. The objections to Claims 26-27, 32-40 and 42-43, 38-39, and 44-45 under 35 U.S.C. 102(b) as being anticipated by Baldeschwieler et al. in view of Iijima et al. should also be allowed since these claims are dependent on Claim 25.

In continuation of the above discussion, the Applicant also adds a new independent Claim 46 as to further define the description of the “pore.” Claim 46 includes the limitation that “the pore is fabricated by removal of material at specific location on the protrusion.” For example, detailed description about the fabrication of a pore and a hole can be found on pages 8-11 of the Specification.

The Examiner has rejected Claims 25-29, 32-45 under 35 U.S.C. 103(a) as being unpatentable over WO 96/38705 to Baldeschwieler, et al. (California Institute of Technology) in view of Iijima, et al., *Single-shell carbon nanotubes of 1-nm diameter*, Nature 1993: 363: 603-605.

The Examiner states “The preceding discussion of Baldeschwieler accompanying the anticipation rejection *supra* is expressly incorporated herein by reference.” The Applicant presents the same arguments as for the rejection under 35 U.S.C. 102(b). Baldeschwieler et al. and Iijima, et al., independently of each other or in combination with each other, do not disclose pore and they do not disclose a carbon nanotube coupled to a pore. Therefore, the Applicant respectfully requests that Claims 25-29 and 32-45 be allowed.

Claims 25-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 96/38705 to Baldeschwieler, et al. (California Institute of Technology) in view of Iijima, et al., *Single-shell carbon nanotubes of 1-nm diameter*, Nature 1993: 363: 603-605 in view of Li, et al., *Large-Scale Synthesis of Aligned Carbon Nanotubes*, Science 1996; 274: 1701-1703 (hereinafter "Li at -").

The Examiner states "The preceding discussion of Baldeschwieler accompanying the anticipation rejection *supra* is expressly incorporated herein by reference. With respect to Claims 30-31, to the extent Baldeschwieler may not disclose placing a catalyst in the pore, note the passage quoted below:

In order to maximize production quality and the resolution of the images obtained by the scanning probes there is still a need for scanning probe tips *having regular, predictable shapes*, smaller radii of curvature and greater angle of taper than currently available.

(Baldeschwieler 2:31 - 3 :3) (emphasis added). Thus, Baldeschwieler suggests a motivation or desirability for regular, predictable tips, which - as noted elsewhere - can be carbon nanotubes. (Baldeschwieler 30: 7) ("nanotubes"). Li discloses carbon nanotubes grown from a catalyst particle (iron) deposited in pores. *See* (Li "entire document, Fig. 4"). Note that Li describes the ability to control the geometries of the carbon nanotubes via the in situ CVD technique. *See e.g.* (Li at 1703, col. 1). One would be motivated to utilize the pore/catalyst as taught by Li in the probe of Baldeschwieler for any number of reasons, for example the ability to grow uniform nanotubes. There is nothing on the record to indicate that the present nanotubes differ from those of the prior art (see specification pgs. 14-16)."

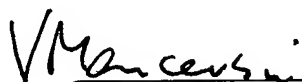
The Applicant has amended Claim 25 as to further define the description of the "pore." The amended Claim 25 includes the limitation that "the pore is fabricated by at specific location on the protrusion." For example, detailed description about the controlled fabrication of a pore and a hole can be found on pages 8-11 of the Specification.

The Applicant presents the same arguments as for the rejection under 35 U.S.C. 102(b) and 103(a) above. Li et al. do not teach about devices having a protrusion, they

do not disclose a device having a pore on a protrusion, they do not disclose a device having a pore fabricated at specific location, and they do not disclose a device having a pore fabricated at specific location on a protrusion. Li et al. disclose growth of uniform films of carbon nanotubes from pores on essentially flat surfaces, "In order to obtain large areas of aligned carbon nanotubes, mesoporous iron/silica substrates with large flat surfaces and uniform distribution of pores are required." (Li 1703:5) Baldeschwieler et al., Iijima, et al., and Li et al. independently of each other or in combination with each other, do not disclose device comprising a protrusion, a pore formed at specific location, and a carbon nanotube coupled to a pore. Therefore, the Applicant respectfully requests that Claims 25-29 and 32-45 be allowed.

In light of the above amendment and remarks, Applicant respectfully submits that the application is in condition for allowance and respectfully requests early allowance. Should the examiner wish to contact the Applicant in order to further prosecution of this matter, the Applicant may be reached at (512) 659-9045.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "V Mancevski", is written over a horizontal line.

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